

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

1. (cancelled).
2. (currently amended) A phosphor having a formula of $(D_{1-x}Eu_x)A_3B_4O_{12}$; wherein D is ~~at least a metal selected from the group consisting of a combination of yttrium and gadolinium and elements of the lanthanide series other than europium~~; A is ~~at least a metal selected from the group consisting of aluminum, gallium, indium, and scandium~~ A is a combination of aluminum, scandium, and gallium; and x is in a range from about 0.001 to about 0.3.
3. (original) The phosphor according to claim 2, wherein x is in a range from about 0.01 to about 0.2.
4. - 7. (cancelled).
8. (currently amended) A phosphor blend comprising: (a) a phosphor having a formula of $(D_{1-x}Eu_x)A_3B_4O_{12}$; wherein D is at least ~~[[a]]~~ one metal selected from the group consisting of yttrium and elements of the lanthanide series other than europium; A is at least a metal selected from the group consisting of aluminum, gallium, indium, and scandium; and x is in a range from about 0.001 to about 0.3; (b) a green light-emitting phosphor; and (c) a blue light-emitting phosphor.
9. (original) The phosphor blend according to claim 8, wherein x is in a range from about 0.01 to about 0.2.

10. (currently amended) The phosphor blend according to claim 8, wherein D is at least one metal selected from the group consisting of Y, La, Ce, Pr, Sm, Gd, Tb, and Lu.

11. (currently amended) The phosphor blend according to claim 8, wherein D is at least one metal selected from the group consisting of Y, La, Gd, and Lu.

12. (original) The phosphor blend according to claim 8, wherein D is a combination of Y and Gd, and A is Al.

13. (original) The phosphor blend according to claim 8, wherein D is a combination of Y and Gd, and A is a combination of Al, Sc, and Ga.

14. (original) The phosphor blend according to claim 8, wherein the green light-emitting phosphor is selected from the group consisting of $\text{LaPO}_4:\text{Ce}^{3+}, \text{Tb}^{3+}$; $\text{GdMgB}_5\text{O}_{10}:\text{Ce}^{3+}, \text{Tb}^{3+}$; $\text{CeMgAl}_{11}\text{O}_{19}:\text{Ce}^{3+}, \text{Tb}^{3+}$; $\text{Ca}_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH}):\text{Sb}^{3+}, \text{Mn}^{2+}, \text{Eu}^{2+}$; $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$; and $\text{BaAl}_8\text{O}_{13}:\text{Eu}^{2+}$; and combinations thereof.

15. (original) The phosphor blend according to claim 8, wherein the blue light-emitting phosphor is selected from the group consisting of $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$; $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH}):\text{Eu}^{2+}$; $(\text{Ba}, \text{Sr}, \text{Ca})\text{BPO}_5:\text{Eu}^{2+}$; and combinations thereof.

16. (currently amended) A method for making a phosphor, the method comprising:

- (a) mixing oxygen-containing compounds of:
 - (1) at least one first metal selected from the group consisting of yttrium and elements of lanthanide series other than europium;

- (2) at least one second metal selected from the group consisting of aluminum, gallium, indium, and scandium;
- (3) boron; and
- (4) europium to form a mixture; and
- (b) heating the mixture in an oxygen-containing atmosphere at a temperature in a range from about 900°C to about 1400°C for a time sufficient to convert the mixture to a phosphor, wherein the phosphor comprises a material having a formula of $(D_{1-x}Eu_x)A_3B_4O_{12}$, where D is at least one metal selected from the group consisting of yttrium and elements of the lanthanide series other than europium; A is at least one metal selected from the group consisting of aluminum, gallium, indium, and scandium, and wherein the oxygen-containing compound of boron is H_3BO_3 , and an amount of H_3BO_3 in the mixture is in excess of stoichiometric amount.

17. (currently amended) The method according to claim 16, wherein the phosphor has a formula of $(D_{1-x}Eu_x)A_3B_4O_{12}$; wherein D is at least one metal selected from the group consisting of yttrium and elements of the lanthanide series other than europium; A is at least one metal selected from the group consisting of aluminum, gallium, indium, and scandium; and x is in a range from about 0.001 to about 0.3.

18. (cancelled).

19. (original) The method according to claim 18, further comprising washing the phosphor after heating to remove excess boron compound.

20. (currently amended) A method of preparation of a phosphor, the method comprising:

- (a) providing a first solution that comprises:
 - (1) at least one compound of at least one first element selected from the group consisting of yttrium and elements of lanthanide series other than europium;

- (2) at least ~~[[a]]one~~ compound of at least ~~[[a]]one~~ second element selected from the group consisting of aluminum, gallium, indium and scandium;
- (3) at least ~~[[a]]one~~ compound of boron; and
- (4) at least ~~[[a]]one~~ compound of europium;
- (b) adding ~~[[a]]one~~ second solution to the first solution to produce a precipitate comprising compounds of the first element, the second element, boron, and europium; the second solution comprising a base selected from the group consisting of ammonium hydroxide; hydroxides of at least one element selected from the group consisting of yttrium, and elements of lanthanide series; organic esters of carboxylic acids; organic amines; and combinations thereof; and
- (c) heating the precipitate in an oxygen-containing atmosphere at a temperature in a range from about ~~[[900 C]]~~900°C to about ~~[[1400 C]]~~1400°C for a time sufficient to convert the precipitate to ~~[[the]]~~a phosphor, wherein the phosphor comprises a material having a formula of $(D_{1-x}Eu_x)A_3B_4O_{12}$, where D is at least one of Y and a rare earth element excluding europium, and A is at least one of Al, Ga, Sc, and In.

21. (currently amended) A light source comprising:

- (a) a source of UV radiation that is located in a sealed housing; and
- (b) a phosphor blend disposed within the sealed housing and adapted to be excited by the UV radiation and to emit visible light, wherein the phosphor blend comprises: a phosphor having a formula of $(D_{1-x}Eu_x)A_3B_4O_{12}$; wherein D is at least one metal selected from the group consisting of yttrium and elements of the lanthanide series other than europium; A is at least a metal selected from the group consisting of aluminum, gallium, indium, and scandium;

- ~~(1) — at least [a] one first metal selected from the group consisting of yttrium and elements of lanthanide series other than europium;~~
- ~~(2) — at least [a] one second metal selected from the group consisting of aluminum, gallium, indium, and scandium;~~
- ~~(3) — boron; and~~

(4) —europium.

22. (currently amended) The light source according to claim 21, wherein the phosphor has a formula of $(D_{1-x}Eu_x)A_3B_4O_{12}$; wherein D is at least one metal selected from the group consisting of yttrium and elements of the lanthanide series other than europium; A is at least one metal selected from the group consisting of aluminum, gallium, indium, and scandium; and x is in a range from about 0.001 to about 0.3.

23. (original) The light source according to claim 22, wherein x is in a range from about 0.01 to about 0.2.

24. (currently amended) The light source according to claim 22, wherein D is at least one metal selected from the group consisting of Y, La, Ce, Pr, Sm, Gd, Tb, and Lu.

25. (currently amended) The light source according to claim 22, wherein D is at least one metal selected from the group consisting of Y, La, Gd, and Lu.

26. (original) The light source according to claim 22, wherein D is a combination of Y and Gd, and A is Al.

27. (original) The light source according to claim 22, wherein D is a combination of Y and Gd, and A is a combination of Al, Sc, and Ga.

28. (original) The light source according to claim 21, wherein the source of UV radiation is a mercury vapor discharge.

29. (original) The light source according to claim 21, further comprising at least a green light-emitting phosphor selected from the group consisting of

$\text{LaPO}_4:\text{Ce}^{3+}, \text{Tb}^{3+}$; $\text{GdMgB}_5\text{O}_{10}:\text{Ce}^{3+}, \text{Tb}^{3+}$; $\text{CeMgAl}_{11}\text{O}_{19}:\text{Ce}^{3+}, \text{Tb}^{3+}$;
 $\text{Ca}_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH}):\text{Sb}^{3+}, \text{Mn}^{2+}, \text{Eu}^{2+}$; $\text{Sr}_4\text{Al}_{14}\text{O}_{25}:\text{Eu}^{2+}$; and $\text{BaAl}_8\text{O}_{13}:\text{Eu}^{2+}$; and
combinations thereof.

30. (original) The light source according to claim 21, further comprising
at least a blue light-emitting phosphor selected from the group consisting of
 $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$; $(\text{Ba}, \text{Sr}, \text{Ca})_5(\text{PO}_4)_3(\text{Cl}, \text{F}, \text{OH}):\text{Eu}^{2+}$; $(\text{Ba}, \text{Sr}, \text{Ca})\text{BPO}_5:\text{Eu}^{2+}$; and
combinations thereof.

31. (original) A light source comprising:
(a) a source of UV radiation disposed in sealed housing, the UV source
comprising a mercury vapor that is capable of absorbing energy of electron to create a
mercury vapor discharge; and
(b) a phosphor blend disposed on an inner surface of the sealed housing, the
phosphor blend comprises a first phosphor having a formula of $\text{LaPO}_4:\text{Ce}^{3+}, \text{Tb}^{3+}$; a
second phosphor having a formula of $(\text{Ba}, \text{Sr}, \text{Ca})\text{MgAl}_{10}\text{O}_{17}:\text{Eu}^{2+}$; and a third phosphor
having a formula of $(\text{Y}_{0.9}\text{Eu}_{0.1})\text{Al}_3\text{B}_4\text{O}_{12}$; the phosphor blend absorbing UV radiation
from the source of UV radiation and emitting light in a visible range.